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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Karin Scherer

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FULBRIGHT & JAWORSKI L.L.P.
600 CONGRESS AVE.
SUITE 2400
AUSTIN, TX 78701

EXAMINER

LANGMAN, JONATHAN C

ART UNIT

PAPER NUMBER

1775

MAIL DATE

DELIVERY MODE

06/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,951	SCHERER ET AL.	
	Examiner	Art Unit	
	Jonathan C. Langman	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-39, 44-60 and 65-67 is/are rejected.
- 7) ☒ Claim(s) 40-43 and 61-64 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/09/06</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

Claims 47-67 were withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant amended claim 47, thereby overcoming the restriction requirement thereby necessitating rejoinder of the claims. Therefore, all claims 22-67 will be examined in this office action.

Claim Objections

Claim 30 is objected to because of the following informalities: The applicant states that the refractive index layer was measured along "a wavelength of 630 nm". However, within the instant specification, the Examiner only finds within the specification "about 630 nm" or "632.8 nm". For continuity, appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 35 and 56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear when the applicant states "further defined as comprising a higher layer of the stacking that is the low index layer coated with a silica and/or ...". When stating "a higher layer", one may get confused and mix

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up this layer with the high index layer. Does the applicant mean "a uppermost layer of the multilayered coating" or "a top layer of the multilayered coating"? Further clarification is needed.

Claims 40 and 61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear as to which "HI layer" the claims are referring to, there are several antecedent basis. The Examiner believes that the applicant is referring to the "HI layer closest to the SiO_xF_y layer" and this is how the claim will be interpreted in this action. However, further clarification is needed to make the claim definite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22-25, 28-30, 33, and 47-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (EP 0975017 A2) referred to as [EP].

Regarding claims 22 and 47, EP teach a fluorine doped silicon layer (FSG) on which is disposed a dielectric silicon dioxide layer cap layer (Lee, [0030]). EP go on to teach that the silica dielectric capping layer is deposited by PECVD and HDP type CVD [0059].

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Regarding claims 23-25, 48-50, EP teach that the silica cap layer can be up to 2000 nm [0060]. Thus overlapping the instantly claimed ranges.

Regarding claim 26, it is inherent that oxygen is used as a gas to form the layers of SiO₂.

Regarding claims 28, 29, 51 and 52, EP teach that the FSG layer is 100-1000 nm thick [0060]. Thus overlapping the instantly claimed ranges.

Regarding claims 30 and 53, although EP is silent to the refractive index of the layer, it is inherent, that the refractive index of the material at the given wavelength and time will be the same, since the materials of Lee and the instant application are similar.

Regarding claims 33 and 54, the stack as described above is formed on a semiconductor substrate and has antireflective properties (abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (EP 0975017 A2). EP teach the deposition of the SiO₂ layer by commonly known practices of PECVD techniques as discussed above. However EP is silent to the use of a rare gas. However it is well known in the art to use an inert gas

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during the use of PECVD techniques including IBAD, in order to aid in the deposition of the gases and particles. Argon and xenon are among these well known inert gases.

Claims 30, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (EP 0975017 A2), referred to as [EP], as applied above, in view of Lee et al. ("Inhomogeneous refractive index of SiO_xF_y thin films prepared by ion beam assisted deposition", referred to as [INH]).

As described above [EP], teach a SiO_xF_y film with a protective silicon oxide film disposed thereon as described above. EP teaches that the SiO_xF_y film is made by PECVD, and does not teach producing the layer through cathodic sputtering with simultaneous gas treatments of oxidation and a fluorinated gas. However, INH teach a method for producing a SiO_xF_y film, comprising IBAD of a silicon film, and simultaneously oxidizing the target and introducing a CF₄ gas into the chamber to turn the layer into a SiO_xF_y film. It would have been obvious to a person having ordinary skill in the art at the time the present invention was made to use the process of INH to form the SiO_xF_y film that is used by EP; because INH has shown that the process is a known method in the art for forming the material. INH go on to teach that the refractive index of the SiO_xF_y layers is 1.41 and 1.44, which overlaps the applicants claimed range of 1.38 to 1.44..

Claims 22-25, 28, 29, 33-39, 44-52, 54-60 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machol et al. (U.S. 5,719,705) in view of INH as discussed above, in view of EP as discussed above.

Regarding claims 22-25, 28, 29, 33-39, 47-52, and 54-60, Machol et al. teach an antireflective coating on a transparent substrate such as an ophthalmic lens. The antireflective coating comprises alternating layers of high and low refractive index materials. Machol teaches that the H.I. layer is the layer closest to the substrate. And also teaches that any number of layers can be used for the Anti reflective coating however, 3-12 layers is preferred (Machol et al., col. 3, lines 40-50). In a specific example shown in Table 1, Machol et al. teach an ARC that comprises 4 layers. A Hi/Li/Hi/Li, with respective thicknesses of 11.33nm/ 27.30nm/ 111.07nm/ 80.91nm. These ranges overlap the instantly claimed ranges. Machol et al. fail to teach that the last Li layer. Machol et al. fail to teach that the last Li layer comprises a stabilized SiO_xF_y layer, with a silica protective layer thereon. However, INH teach a SiO_xF_y layer as described above, and goes on to teach that It would have been obvious to a person having ordinary skill in the art at the time the present invention was made in order to gain be advantageous to use this layer in an antireflective coating because the low index silicon oxyfluoride thin films can reduce the number of high and low index multilayers and widen the bandwidth of multilayer high reflectors. Therefore It would have been obvious to a person having ordinary skill in the art at the time the present invention was made to use the SiO_xF_y layer as taught by INH in the antireflective coating of Machol et al. because INH teaches the many benefits encountered by the alternative

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use of the low refractive index material. Furthermore, a reduction in the number of high low index multilayers will result in a lower cost of production. Thus the Refractive index would take on a thickness of the outer Li as taught by Machol et al. to be 80.91 nm.

The combination of INH and Machol fail to teach a protective layer of SiO_2 on top of the SiO_xF_y layer, however, EP teaches the use of an SiO_2 layer up to 2000 nm as described above, to help with the out diffusion of fluorine from the SiO_xF_y layer. It would have been obvious to a person having ordinary skill in the art at the time the present invention was made to use a silica layer on top of the SiO_xF_y layer in order to maintain the structural limitations of the underlying SiO_xF_y layer during processing and to prevent out diffusion of fluorine from the SiO_xF_y which will change the values of refractive index, and material properties of the SiO_xF_y layer.

Regarding claims 44-46 and 65-67, Machol et al teach that the antireflective coating is placed over a substrate. The substrate may comprise a laminated single version lenses each having a scratch resistant coating (Col. 8, lines 61-68). And in col. 3, lines 1-25, Machol et al. teach that the substrate may be an ophthalmic lens comprising an organic glass.

Allowable Subject Matter

Claims 40-43 and 61-64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan C. Langman whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri 9:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCL.



JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER

6/25/07